Award Number: W81XWH-11-1-0831

TITLE: Application of Near Infrared Spectroscopy, Intravascular Ultrasound and the Coronary Calcium Score to Predict Adverse Coronary Events

PRINCIPAL INVESTIGATOR: Dr. Charles Lambert

CONTRACTING ORGANIZATION: University Community Hospital
Tampa, FL 33613

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PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

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Application of Near Infrared Spectroscopy, Intravascular Ultrasound and the Coronary Calcium Score to Predict Adverse Coronary Events

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6. AUTHOR(S)
Dr. Charles Lambert

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University Community Hospital
3100 East Fletcher Ave
Tampa, Florida 33613

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Fort Detrick, Maryland 21702-5012

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Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
Final IRB approval was granted effective July 15, 2013. Patient screening, enrollment and data acquisition is ongoing. Additional co-investigators have been added to the study including James Smith, MD, Vasco Marques, MD, Mohammed Tabesh, MD, Jordan Hopkins, MD, Asad Sawar, MD, Alex Michel, MD, Faisal Shaikh, MD and Hesham Fakhri, MD. 79 patients have been screened for the study. 24 patients were subsequent screen failures. Thirteen patients have completed enrollment and imaging. One SAE, unrelated to the study, was reported to the IRB.
Study operation continues as planned.

15. SUBJECT TERMS
coronary artery disease, near infrared spectroscopy, calcium scoring, intravascular ultrasound

16. SECURITY CLASSIFICATION OF:

			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON USAMRMC
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U	UU	15	19b. TELEPHONE NUMBER *(include area code)*

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Introduction

The aim of the present project is to

1. Utilize near infrared intra-coronary spectroscopy as an adjunctive technique during cardiac catheterization to identify potential vulnerable plaque morphology
2. Relate its presence to intermediate and long-term outcomes in patients defined as angina, myocardial infarction, death, congestive heart failure, stroke and need for revascularization over five years.
3. To compare near infrared intra-coronary spectroscopy data to that from coronary calcium scoring, angiographic findings and intracoronary ultrasound in predicting those outcomes in #2.

Body

Revision and review of the original protocol was followed by institutional review board approval of the protocol with final informed consent revision effective on July 15 2013.

Data for run-in patients were previously described.

Subsequently, additional co-investigators have been added to the study including James Smith, MD, Vasco Marques, MD, Mohammed Tabesh, MD, Jordan Hopkins, MD, Asad Sawar, MD, Alex Michel, MD, Faisal Shaikh, MD and Hesham Fakhri, MD.

Improved catheters and console components were obtained in January 2014 and retraining was completed.

Test calcium scoring was performed and active patient recruitment was begun.

Key Research Accomplishments

79 Patients have been screened for the study following the initial run-in patients included in the prior report:

6/12/14	Smith	RCA stent, LAD small with 70% lesion poor target, Circ too tortuous
12-Jun-14	Smith	Declined
6/12/2014	Tabash	PreOp for surgery
6/19/14	Smith	screen failed in cath lab
6/19/14	Smith	Approached to consent enrolled
6/19/14	Smith	Approached to consent then enrolled
6/20/14	Marques	Not good candidate multiple problems
6/24/14	Smith	Cancelled cath
6/18/14	Smith	screen failed in cath lab
6/25/14	Smith	Approached to consent then screen fail in cath lab
7/9/14	Smith	Approached to consent then screen fail in cath lab
7/9/14	Smith	Approached to consent then screen fail in cath lab
7/25/14	Smith	Declined all research
7/16/14	Tabesh	No IVUS targets due to bypass grafts, small vessels and severe disease
8/6/14	Smith	
8/6/14	Smith	
8/6/14	Smith	
8/1/14	Smith	Spanish speaking only
7/30/14	Smith	screen failed in cath lab
7/31/14	Smith	extremely anxious
7/30/14	Smith	life expectancy less than 3 years
7/22/14	Marques	PreOp for surgery
7/22/14	Smith	life expectancy less than 3 years
7/21/14	Sawar	signed consent Dr Sawar decided not to use NIRS despite good targets
7/21/14	Smith	canceled due to family emergency
7/21/14	Smith	screen failed in cath lab
7/21/14	Marques	enrolled
7/23/14	Tabesh	Spanish speaking only
7/25/14	Tabesh	PreOp for surgery
7/23/14	Tabesh	at last minute MD switch to nonDOD MD
8/14/14	Tabesh	preOp for surgery
8/13/14	Marques	preOp for orthopedic surgery no CAD right heart for valve issues
8/12/14	Marques	declined due to moving in 2 weeks to Nebraska has too much going on
8/11/14	Tabesh	PeOp for surgery
8/11/14	Marques	consented for study and at last minute MD change in cath lab to nonDOD MD
8/14/14	Tabesh	life expectancy less than 3 years
8/21/14	Tabesh	life expectancy less than 3 years
8/22/14	Tabesh	PreOp for surgery
8/22/14	Marques	respiratory and valve issues, multiple medical problems
8/22/14	Marques	life expectancy less than 3 years
9/12/14	Tabesh	just prior to cath MD changed to nonDOD MD
9/10/14	Marques	just prior to cath MD changed to nonDOD MD
8/27/14	Smith	poor historian, s/p current surgery, wound center for active ulcers other complications
8/27/14	Tabesh	preOp for surgery
9/4/14	Smith	life expectancy less than 3 years, very advanced age
9/3/14	Marques	just prior to cath MD changed to nonDOD MD
9/4/14	Marques	Spanish speaking only
9/3/14	Hopkins	declined
9/10/14	Smith	advanced age, no targets for imaging due to bypass grafts and several stents
10/1/14	Hopkins	life expectancy less than 3 years very advanced age
10/3/14	Marques	no IVUS targets due to bypass grafts, stents
10/3/14	Tabesh	no IVUS targets due to bypass grafts, stents
9/30/14	Tabesh	insufficient time to consider research, discuss, read consent prior to cath
10/1/14	Hopkins	declined due to other health issues
9/18/14	Marques	very advanced age
9/22/14	Hopkins	very advanced age
10/7/14	Shaikh	no targets to image
10/22/14	Smith	no targets due to prior CABG, and small vessels
10/23/14	Smith	advanced age
10/24/14	Tabesh	no targets due to prior CABG, and small vessels
10/28/14	Marques	Not good candidate multiple problems
10/24/14	Tabesh	canceled Dwight Walker
10/20/14	Smith	stents in all vessels
10/14/14	Smith	declined
10/14/14	Marques	declined
10/14/14	Gangadharan	preop for TAVR surgery, very advanced age
10/8/14	Marques	Acute TIA
10/3/14	Marques	case done unexpectedly earlier than scheduled
10/31/14	Fakhri	case canceled
10/30/14	Smith	consented for peripheral study
10/8/14	Smith	no superuser working at all no rep on site
10/15/14	Smith	case canceled
11/4/14	Gangadharan	Spanish speaking only
11/6/14	Tabesh	existing RCA proximal stent, no CAD other vessels
11/7/14	Marques	advanced age, several med issues, visual impairment
11/12/14	Gangadharan	Spanish speaking only
11/12/14	Tabesh	life expectancy, age
11/13/14	Smith	Very adnanced age
11/12/14	Gangadharan	no targets, CABG

22 Patients were subsequent screen failures:

Date of SCREEN FAIL:	Sub-I MD:	Reason for SCREEN FAIL:
6/19/14	Smith	Radial artery too small to accommodate NIRS catheter
6/26/14	Smith	RCA stent mid vessel, LAD CTO proximal in vessel, Circ too small
7/10/14	Smith	Unable to torque and advance NIRS catheter in vessel
7/10/14	Smith	no CAD
7/22/14	Smith	no CAD
7/22/14	Sawar	Md dd not want to use NIRS
7/25/14	Tabesh	CABG consult no targets to image
7/31/14	Smith	no CAD
7/31/14	Smith	no CAD
8/7/14	Smith	no CAD to image
8/11/14	Marques	just prior to cath MD changed to nonDOD MD Dr Fakhri
8/28/14	Smith	no CAD
9/3/14	Marques	disease too distal in vessels
9/11/14	Hopkins	no CAD
9/18/14	Smith	no CAD
9/30/14	Marques	severe 3 vessels disease no targets for IVUS
10/1/14	Hopkins	no disease
10/9/14	Tabesh	existing stent and in other vessels Md did not want to expose pt to anticoag isk
10/16/14	Smith	LAD stent MD said no disease on visual in other vessels
10/17/14	Gangadharan	mycardial bridging no disease to image
10/23/14	Marques	no CAD, non ischemic CM
10/30/14	Smith	prior positive coronary CT, stenosed diagonal no CAD Circ RCA LAD
11/6/14	Michel	Case scheduled for 1200, MD started at 1500, MD said he did not have time to NIRS for study
11/7/14	Tabesh	RCA totoally occlueded, Circ too small, LAD too tortuous

14 Patients completed all imaging and are enrolled for long term follow-up:

6/19/14	Smith	1	RCA
6/20/14	Smith	2	RCA, LAD
6/26/14	Smith	1	RCA
7/10/14	Smith	1	RCA
7/24/14	Marques	2	LAD CIRC
9/4/14	Smith	1	LAD
9/8/14	Hopkins	1	LAD
9/24/14	Shaikh	2	LAD, Ramus
10/6/14	Hopkins	1	RCA
10/6/14	Marques	2	LM, CIRC
10/7/14	Smith	1	RCA
10/10/14	Marques	2	LAD, RCA
10/23/14	Gangadharan	1	LAD
11/13/14	Smith	1	RAC

Reportable Outcomes

Data are being accrued.

Conclusion

Near infrared spectroscopy and simultaneous intravascular ultrasound images can be obtained safely in patients. Using these technologies make identification of vulnerable plaques possible the current study valuable as defined in the statement of work.

References

None

Appendices

6 Month Interim IRB Review

FLORIDA HOSPITAL PEPIN HEART INSTITUTE
Dr. Kiran C. Patel Research Institute
The skill to heal. The spirit to care.®

Investigator's Progress Report

Continuing Review / Interim Report / Final Report of Research

Florida Hospital Tampa Bay Division IRB

Full Board Continuing Review Instructions:	**Expedited Continuing Review Instructions:**
Submission deadline: All Part A & B documents due on the 1st of the month for review on the 3rd Tuesday. **All documents are to be submitted under (2) separate Part A & B email attachments or 17 collated paper copies.** **Ensure all documents and revisions are clearly identified, *and in the following order:***	If ☐ the protocol is permanently closed to the enrollment of new participants, ☐ all participants have completed all research-related therapy / interventions (labs, x-rays, etc.), and the ☐ research remains active only for long-term follow-up of participants; -OR- ☐ No participants have been enrolled and no additional risks have been identified; -OR- ☐ The remaining research activities are limited to data analysis only; your continuing review ***may*** be eligible for Expedited Review (45 CFR 46.110). ***Expedited submissions may be submitted at any time via Email or 3 paper copies to the IRB.***

Final Report Instructions: If the project is complete*, submit this form and check "Final Report - Termination Requested". ***The form must be completely filled out, and any publications and/or data analysis reports included with the submission.***

Part A ☒ #1.	- Continuing Review Application filled out completely, and signed. ***Please note that blanks and/or insufficient information may result in a delay of your review/approval.***

Contact Information

Today's Date: ***31 Oct 2014***	Date of Initial Review: ***17Jul2012***	Date of Last Continuing Review: ***13 Jun2014*** Date Last Seen by the IRB: ***13Jun2014***	
Type of Submission:	☐ Continuing Review ☒ Interim Report ☐ Final Report – Termination requested		
Type of Review Requested:	☒ Full Review ☐ Expedited Review		
Protocol Information:	Title: ***Proposal 10169004 - Application of Near Infrared Spectroscopy, Intravascular Ultrasound and the Coronary Calcium Score to Predict Adverse Coronary Events***		
	Protocol #: ***5/2012***	Protocol Version (current): ***5/2012***	
Study Type:	☐ Device	IDE #:	Phase#:
	☐ Drug	IND #:	Phase #:
	☐ Post Market Approval Study ☐ Registry ☒ Prospective Data Review ☐ Retrospective Data Review		
	☒ Investigator Initiated Study *Please describe type of trial: ***Prospective Data Review***		
	☐ Other (please describe):		
Principal Investigator:	***Charles Lambert, MD, PhD***		
Primary Contact:	***Yvonne Gopsill, RN, BSN, CCRC***	E-mail:	***Yvonne.Gopsill@ahss.org***
Telephone:	***56517***	Fax:	***57574***

Current Status of Project (check only one):

Part A ☒ #2.	Please summarize activity for all study types. **For data review studies, summarize the number of charts, etc, that were reviewed.*

* No participants on therapy or in follow-up, no data collection being done, and no data queries being resolved.

☐ Study has not yet begun	☐ No participants entered
☒ Currently in Progress	**Number of participants enrolled:** *13*
☐ Closed to participant enrollment (remains active) Are study interventions (labs, x-rays, etc.) complete? Yes ☐ No ☒	**Enrollment Summary:** On active therapy/interventions: *13* Long term follow-up – therapy/interventions completed: *0* Follow-Up complete (study in data analysis only): *0*
Summary of Transfer Patients: Subjects Transferred In: Subjects Transferred Out: Previously reported to the IRB? Yes ☐ No ☐ **If no, please summarize in comments* *Note: numbers should be recorded in applicable enrollment summary category*	**Withdrawal Summary:** Subject withdrawn by PI: *0* Subject withdrew from study: *0* Reached End Point – Exited From Study: *0* **Other:** *n/a* *Describe:* **Total :** *13* **Should match number of participants enrolled* **Number of Death's** *0*
☐ Termination Requested – **Site Closure:** Study remains open, but site closed/withdrawn. Reason for Closure:	
☐ Termination Requested – **Study Closure**: No further subject accrual or data analysis / collection.	
Comments related to project status: ***The study is not closed to enrollment.***	

Summary of Informed Consent

Part A ☒ #3.	Informed Consent with any proposed Tracked Changes.†

☒ Informed Consent Form (no change):	☐ ICF with footer Version **change only:** **changed to reflect the current protocol version*
☐ New Revised Informed Consent Form	☐ Other, (specify):
❖ If including a revised informed consent form, please provide a summary of the revisions *(*required)*:	
❖ Are the informed consent revisions related to changes in the protocol? ☐Yes ☐No *If yes, please explain:	
❖ Do the informed consent changes affect patient safety? ☐Yes ☐No *Please explain:	
❖ Will study participants be re-consented? ☐Yes ☐No *If yes, please describe at what point they will be re-consented:	
Comments:	

Summary of Individuals Screened, Entered and Withdrawn *at the Florida Hospital Tampa Bay Division site(s) only*

Part A ☒ #4.	**Summary of:** Subject enrollment ****Required for all study types, including retrospective chart reviews.***

Number of individuals **screened** for entry into study since the start of the project? ***22 were screen fails, 13 enrolled***	35

† Consent changes must be easily identifiable to the RERB committee.

Number of individuals **entered** into the study since the start of the project?	13
Number of individuals **withdrawn** from the study since the start of the project? **Describe the reason for withdrawal:**	0
Number of individuals entered into the study since the last IRB review?	13
Number of individuals withdrawn from the study since the last IRB review? **Describe the reason for withdrawal:**	0
Comments:	

Summary of Protocol and Investigator Brochure

Part A ☒ #5.	**Summary of:** Protocol changes, Investigator Brochure changes, etc., as applicable. ***A summary of changes is required for each item selected.***

Has the protocol been revised since the last Continuing Review? ☐Yes ☒No
*If yes, please provide a brief summary of the changes:

Has the investigator brochure been revised since the last Continuing Review? ☐Yes ☐No
*If yes, please provide a brief summary of the updates: ***n/a***

If including a protocol and/or investigator brochure revision with the Continuing Review, please provide the following information:

☐ New Protocol Revision / Amendment Provide a summary of the revisions:	Current Version: New Version:
❖ Are the protocol revisions a result of new information that effects patient safety? *If yes, please explain:	☐Yes* ☐No
❖ Do the protocol revisions require changes to the informed consent form? *If yes, please explain:	☐Yes* ☐No
☐ Change in Protocol Personnel Describe change:	
☐ Study Enrollment Closure Reason for closure:	
Comments:	

☐ New Investigator Brochure Revision Provide a summary of the revisions:	Current Version: New Version:
❖ Do the updates include new information that effects patient safety? *If yes, please explain:	☐Yes* ☐No
❖ Do the updates require changes to the informed consent form? *If yes, please explain:	☐Yes* ☐No
Comments:	

Summary of Study Related Material

Part A ☐ #6.	**Other:** Please select all applicable material reviewed/approved by the IRB, i.e., Advertising Material, Patient Retention Material, etc., as applicable, since the last Continuing Review.

☐ Advertising materials – no change	☐ Retention material – no change
☐ Manual of Procedures (MOP) – no change	☐ Instructions for use – no change
☐ CRF's – no change *Note: CRF's require IRB review if not standardized industry forms, such as investigator initiated forms used to collect data.*	
☐ Other – no change *(specify)*:	

If including new or revised material with the Continuing Review, please provide the following information:
☐ New/Revised Advertising Material Provide a summary of the revisions:
☐ New/Revised Retention Material(describe) Provide a summary of the revisions:
☐ New/Revised Manual of Procedures (describe) Provide a summary of the revisions:
☐ New/Revised Instructions for Use (describe) Provide a summary of the revisions:
☐ New/Revised CRF's Provide a summary of the revisions:
☐ Other, (specify)
Comments:

Part A ☐ #7. **Summary of:** Serious Adverse Events, enrollment issues, risk changes, etc., as applicable.

Number of adverse events (at this site) requiring submission to the IRB	*0*
Number of adverse events (at any site) requiring submission to the IRB	*0*
Any unanticipated problems involving risks to participants or others? Provide a brief explanation of unanticipated problems involving risk that occurred internally and/or externally, and explain risk issues that prompted Informed Consent, Protocol, or Investigator Brochure revisions: ***Include any relevant reports, literature, etc.**	☐Yes* ☒No
Any problems obtaining informed consent? If yes, please summarize (include relevant documents):	☐Yes* ☒No
Any problems with enrollment? If yes, please summarize (include relevant documents):	☐Yes* ☒No
Have any participants or others complained about the research? If yes, please summarize (include relevant documents):	☐Yes* ☒No
Have any obvious, study-related benefits occurred for participants? If yes, please summarize (include relevant documents):	☐Yes* ☒No
Have any risks or potential benefits for this research changed? If yes, please summarize (include relevant documents):	☐Yes* ☒No
☐ Other, (specify):	
Comments:	

Since the last IRB review, have you received any of the following types of information?

Part A ☒ #8. Multi-center trial reports, Data and Safety Monitoring Board reports, Interim findings, Published literature, etc.

Multi-center trial reports? If yes, please summarize (include relevant documents):	☐Yes* ☒No
Data and Safety Monitoring Board reports? *(please include reports that have not been previously reported to the IRB)*	☐Yes* ☒No
Interim findings? If yes, please summarize (include relevant documents):	☐Yes* ☒No
Published literature? Previously submitted to the IRB? *(If no, please include literature not previously reported to the IRB)*	☐Yes* ☒No ☐Yes* ☒No
Any other relevant information regarding this research, especially information about risks?	☐Yes* ☒No

If yes, please summarize:	
Could any of the information described above relate to the participants' willingness to continue participating? If yes, please summarize:	☐ Yes* ☒ No
☐ Other, (specify)	
Comments: ***Study is only being conducted at this site.***	

Submission deadline: All Part B documents due on the 1st of the month for full board review on the 3rd Tuesday. All documents are to be submitted under separate Part B email attachment or 3 collated paper copies. Ensure all documents and revisions are clearly identified, *and in the following order:*	
Part B ☒ #1.	**"Current Version"** of the Informed Consent in use, ***showing the IRB stamp.*** / Paper Copy = 1 Copy
Part B ☐ #2.	**"Clean" Informed Consent** incorporating all changes and with 1.5" footer margin to accommodate new IRB stamp. ***ONLY a current stamped version is approved for patient use.*** / Paper Copy = **2 *Copies*** **Note: Investigator Initiated studies should include a description of the consent process in the study protocol**
Part B ☐ #3.	**Full Versions of any and all: New** full protocol incorporating all changes, **New** complete Investigator Brochure incorporating all changes, **New** complete Manual of Procedures (MOP) incorporating all changes, etc., as applicable. / Paper Copy (if revised) = ***3 Full Version Copies***

Signature of Principal Investigator

11/3/14
Date

Review Details

[489208-4] DOD "Application of Intracoronary NIRS, IVUS and Coronary Calcium Score to Predict Adverse Corona

Florida Hospital Tampa Bay IRB, Tampa Bay, FL

Submission Details	
Submitted To	Florida Hospital Tampa Bay IRB, Tampa Bay, FL
Submitted by	Yvonne Gopsill
Submission Date	11/03/2014
Submission Type	Continuing Review/Progress Report
Local Board Reference Number	2012-018

Review Details:

Agenda	Review Type	Board Action	Effective Date	Project Status	Expiration Date
11/18/2014 12:00 PM	Full Committee Review	Acknowledged	11/18/2014	Active	06/13/2015